

Liner

Specification

The present invention relates to a supporting sleeve for leg or arm stumps, namely a liner, with the features of the preamble of claim 1.

Liners for prostheses, such as leg prostheses, arm prostheses or the like, consisting of a sleeve enclosing the stump from its distal end and made of an elastic, electrically insulating material such as silicone, polyurethane or the like are known (WO 88/00032, WO 98/49977, EP 0 976 371 A1). Such liners are used as a cushioned connection between stump and prosthesis shaft, but are also used postoperatively in order to have a subsiding and shaping effect in the healing phase. It is furthermore known that so-called phantom pain can arise after amputations, and can be positively influenced by electromagnetic screening of the stump, e.g. by an electrically conducting textile material (US Patent 4, 653, 473 A).

The present invention has as its object to provide a liner which has such an alleviating effect against stump pains, but without forfeiting the essential properties of a liner.

The object is attained by the characterizing portion of claim 1. Developments and advantageous embodiments of the invention are included in the further claims.

According to the invention, a supporting sleeve for leg or arm stumps, namely a liner, consisting of a sleeve surrounding the stump from its distal end, is of an elastic, electrically insulating material, characterized in that the sleeve has at least partially a layer of conducting material running around it.

According to a first embodiment of the invention, the electrically conducting layer is applied to the sleeve on the outside and consists of a layer of an elastic, conductively equipped textile material or plastic. For example, it can consist of a material onto which metal has been evaporated. Furthermore, for example, the plastic can be applied as an adhesive.

According to a second embodiment of the invention, the layer is a textile mechanical reinforcement (matrix), beginning at the distal end of the liner, of an electrically

conductive material, the matrix for example consisting of an ordered or unordered threads of a conductive material.

According to a particularly advantageous embodiment of the invention, a conductive region is arranged between the stump and the layer of conductive material, the conductive region preferably being arranged at the distal end of the stump.

According to an alternative to the preferred embodiment of the invention, the liner has at its distal end a liner cup and if necessary a pin adapter for connection to a prosthesis, the liner cup and/or the pin adapter consisting of an electrically conductive material, or being equipped with such. The liner cup and/or the pin adapter are in contact with the layer of electrically conductive material, the conductive region being arranged between the stump and the liner cup and/or the pin adapter. If the liner is used exclusively for postoperative treatment, the liner cup and pin adapter can be omitted.

An electrical resistance of $< 10^5$ ohm is preferably present between the stump and the conductive region.

The invention is described in detail hereinafter, by way of example, with use of a drawing.

Figure 1 shows a liner 1 of an electrically conductive silicone material, for receiving a leg stump. The liner 1 is provided with a cover 6 of a textile material. A layer 2 of an electrically conducting material, for example of metal threads, is embedded in the liner 1. At the distal end of the liner there is located a pin adapter 4, known *per se*, for connecting to a lower leg prosthesis. The liner 1 is supported from below by a so-called liner cup 3. Such a construction is known, for example, from DE 100 12 929 A1. The pin adapter 4 and the liner cup 3 consist of metal and are electrically conductive. The liner cup 3 is in contact with the incorporated matrix 2 of electrically conductive material. For producing an electrically conducting connection to the distal end of the stump, an electrically conductive region 5 is arranged above the pin adapter 4, and consists, for example, of a felt of an elastomeric material which is made electrically conductive (evaporated metal, containing conductive carbon) or has through threads of graphite, metal or the like, the electrically conducting region 5 and the liner having substantially the same hardness of material.